

### **REMARKS**

Claims 1-16 and 28 are rejected. Claims 17-27 are withdrawn from consideration. Claims 1-5 and 28 have been amended. Accordingly, claims 1-28 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

The basis for the amendment to claims 1 and 28 can be found on page 3, lines 1-4 and page 6, lines 7-10 of the specification as originally filed.

#### **Rejection Under 35 U.S.C. §102(b) over Bauer et al.:**

The Examiner has rejected claims 1, 2, 6, 9 and 15 under 35 U.S.C. 102(b) as being anticipated by Bauer et al. (US Patent No. 5639589 - IDS entry 1/21/2005). The Examiner indicates that plastic is commonly used as a support for protein microarrays and Bauer et al. teaches polyester and polyethylene support films which represent a type of plastic. The Examiner further indicates that the argument that Bauer et al does not teach an adhesive interlayer that does not optically interfere with protein microarray applications is not found persuasive. The Examiner refers to the Office Actions mailed 4/5/2006 and 1/5/2007 to address previous arguments. The rejection is respectfully urged as in error as specific binding is not an inherent property of gelatin, the reference fails to disclose a protein microarray, and the reference fails to teach a gelatin layer substantially resistant to non-specific binding.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently described in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim.

There are at least three patentably distinct aspects of the presently claimed invention not disclosed by Bauer et al. First, Bauer et al. relates to a polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base and fails to disclose a protein microarray as claimed by the instant invention. Second, Bauer et al. fails to disclose an adhesive interlayer that does not optically interfere with protein microarray applications. Third, Bauer et al. further fails to expressly disclose a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, which would be useful as a protein microarray.

The reference fails to disclose protein microarrays:

Bauer et al. discloses a polyester photographic film base, not a protein microarray as claimed by the instant invention. A protein microarray is prepared by modifying a protein microarray support and depositing biological capture probes on the protein microarray support at predefined locations. See Specification Page 5, lines 5-8. A microarray contains a plurality of capture probes. Bauer et al. fails to disclose an array, no less a protein microarray as claimed by the instant invention. A plain reading of Bauer et al. indicates that the reference relates to a photographic elements having a light-sensitive photographic layer on a film base. The reference provides no indication that the film base is suitable as protein microarray. The reference fails to disclose protein microarrays and therefore cannot anticipate the instant invention.

The reference fails to disclose an interlayer that does not optically interfere with protein microarray applications:

The Examiner indicates in the Office Action dated 4/5/06 that Bauer et al. discloses an adhesive gelatin layer and additional colored layers containing gelatin. The Examiner states, as evidenced by Schor et al., that fibronectin is a protein that binds denatured collagen (a.k.a. gelatin), thus

inherently, the entirety of the gelatin based film of Bauer et al. would perform as a protein microarray element. Even taking this as true the reference fails to teach an adhesive interlayer layer that does not optically interfere with protein microarray applications.

Assuming the adhesive gelatin layer of Bauer et al. is capable of binding biological probes as indicated by the Examiner, this interlayer would optically interfere with protein microarray applications. Biological probes would non-specifically bind to the adhesive interlayer creating problems for protein microarray applications. Any biological probes bound to the interlayer optically interfere with the detection of biological probes specifically bound to the gelatin layer. As Bauer et al. relates to photographic film supports and not protein microarrays the reference fails to recognize this problem.

The reference fails to disclose a gelatin layer  
substantially resistant to non-specific binding

Bauer et al. fails to disclose a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes. Neither is non-specific binding in gelatin an inherent property. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known non-specific binder, and problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, illustrating the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. The instant invention claims a gelatin layer substantially resistant to non-specific binding. This limitation is not disclosed by the reference. Bauer et al. relates to photographic film supports, not protein microarrays. The reference discloses colored gelatin layers but fails to disclose a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes.

Since Bauer et al. fails to teach, expressly or inherently, a gelatin layer substantially resistant to non-specific binding, protein microarrays, or an interlayer that does not interfere with protein microarray applications, the reference fails to anticipate the present claims. For these reasons and the reasons

set forth in the communications dated March 8, 2007 the Applicants request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Roberts et al.:**

The Examiner has rejected claims 1, 2, 6-9 and 15 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent No. 5,639,589 - IDS entry 1/21/2005) in view of Roberts et al. (US Patent No. 5,380,642).

The Examiner contends that the Office Actions dated 4/5/2006 and 1/5/2007 adequately address Applicants' prior arguments. Applicants contest this assertion.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Roberts relates in general to photography and in particular to the preparation of silver halide emulsions that are useful in photography. More specifically, this invention relates to a novel process for preparing a thin tabular grain silver halide emulsion by nucleating the silver halide grains with a gelatino-peptizer or with the use of certain synthetic polymers that serve as effective nucleation peptizers and then growing the silver halide grains with the use of either a gelatino-peptizer or certain synthetic polymers that serve as effective growth peptizers.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable

expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The references fail to teach or suggest all of the claimed limitations:

As discussed above Bauer et al. fails to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications. Roberts also fails to teach or suggest these limitations. Neither reference relates to protein microarrays, Neither reference teaches an adhesive interlayer that does not optically interfere with protein microarray applications, and neither reference teaches a gelatin layer substantially resistant to non-specific binding as presently claimed.

The references lack a likelihood of success:

The references provide no likelihood of success in the use of a support and a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. As discussed above, the present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further provides evidence for non-specific binding, illustrating the non-specific binding of protein to coated gelatin surfaces. The references fail to disclose any likelihood of success in using a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes. Therefore the references provide no likelihood of success for forming a protein microarray having a gelatin layer, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

**The instant invention has surprising results:**

As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Arenkov et al.:**

The Examiner has rejected claims 1-6, 9 and 15 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent No. 5639589 - IDS entry 1/21/2005) in view of Arenkov et al. (2000 Analytical Biochemistry 278:123-131- IDS entry 11/10/2003 transferred to PTO-892).

The Examiner indicates that Bauer et al. teaches a gelling layer and that Arkenov et al. concerns protein microchips. The Examiner further indicates that protein microarrays are synonymous with protein microchips. The Examiner contends that the Office Actions dated 4/5/2006 and 1/5/2007 adequately address the remainder of Applicants' prior arguments. Applicants contest this assertion.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Arenkov relates to the use of a modified polyacrylamide gel in a protein microchip.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The references fail to teach or suggest all of the claimed limitations:

As discussed above Bauer et al. fails to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications. The Examiner indicates that Bauer et al. teaches the gelatin layer and that Arenkov teaches protein microchips, which are synonymous with protein microarrays. However, neither reference teaches a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, or an interlayer that does not optically interfere with protein microarray applications as claimed by the instant invention.

The references lack a likelihood of success:

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that

gelatin is known for non-specific binding of protein. Arenkov provides no likelihood of success with the use of a gelatin layer, as the reference teaches the use of a polyacrylamide gel layer. Therefore, the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

**The instant invention has surprising results:**

As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Christopher:**

The Examiner has rejected claims 1, 2, 6, 9, 13, and 15 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent No. 5639589 - IDS entry 1/21/2005) in view of Christopher (US Patent No. 2309340).

The Examiner indicates that the references both concern gelatin compositions and therefore combination is appropriate. The Examiner contends that the Office Actions dated 4/5/2006 and 1/5/2007 adequately address the remainder of Applicants' prior arguments. Applicants contest this assertion.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester



photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Christopher relates to a method of extracting gelatinous material from gelatinous material stock such as hide trimmings, fleshings, sinews, and the like.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The references fail to teach or suggest all of the claimed limitations:

As discussed above Bauer et al. fails to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications. Christopher also fails to teach or suggest these limitations. Christopher relates to a method of extracting gelatinous material and fails to disclose protein microarrays. Bauer et al. relates to photographic film and fails to disclose protein microarrays. Neither reference teaches a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications as claimed by the instant invention.

The references lack a likelihood of success:

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of

maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes. Furthermore, neither reference relates to protein microarrays and therefore provide no guidance within the field of the instating invention.

The instant invention has surprising results:

As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

The references are non-analogous art:

The references cited by the Examiner comprise non-analogous art. In order to rely on a reference as a basis for rejection of Applicant's invention, a reference must either be in the field of the Applicant's endeavor or reasonably pertain to the particular problem with which the invention is concerned. Here, the cited references are not in Applicant's field of endeavor, that is, a protein microarray element. Neither reference cited addresses protein microarrays. Furthermore, Christopher discloses a method of extracting gelatinous material from stock, and fails to disclose any information relating to protein microarrays. Christopher further fails to disclose an adhesive interlayer as claimed by the instant invention. Christopher relates to a method for preparing glue from gelatinous material and not to the field of protein microarrays.

Regarding the Examiner's contention that both references concern gelatin compositions, neither reference is in the field of the endeavor or reasonably pertains to the particular problem with which the invention is concerned. The instant invention is a protein microarray that utilizes an interlayer to bind a substrate and gelatin layer. The gelatin layer is substantially resistant to non-specific binding and contains functional groups capable of specific binding of biological probes. Neither reference relates to this field. Furthermore, neither reference discloses the problem solved by the instant invention.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, comprise non-analogous art, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and respectfully request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Bonderman:**

The Examiner has rejected claims 1, 2, 6, 9, 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent No. 5,639,589 - IDS entry 1/21/2005) in view of Bonderman (US Patent No. 5,348,852).

The Examiner indicates that fish gelatin is capable of forming a layer, albeit at a lower temperature. The Examiner contends that the Office Actions dated 4/5/2006 and 1/5/2007 adequately address the remainder of Applicants' prior arguments. Applicants contest this assertion.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Bonderman relates to improved compositions such as medical and diagnostic compositions, and to methods of their preparation and use. The improved compositions are highly stable and have desirable physical and

chemical properties. The compositions comprise an effective amount of gelatin from cold water fish skin as a protein base.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The references fail to teach or suggest all of the claimed limitations:

As discussed above Bauer et al. fails to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications. Bonderman also fails to teach or suggest these limitations. Neither reference teaches a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, protein microarrays, or an interlayer that does not optically interfere with protein microarray applications as claimed by the instant invention.

The references lack a likelihood of success:

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further illustrates the non-

specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes. In addition, Bonderman is associated with a fish gelatin. The benefits of this gelatin appear to be its labile nature and its resistance to gelatin. See col. 1, lines 54-56; see also col. 2, lines 26-29. The present invention utilizes at least one layer of gelatin. The gelatin of Bonderman would not produce a layer of gelatin on the support. See col. 5, lines 53-55. Bonderman only teaches using fish gelatin that remains ungelled and does not teach utilizing a layered structure. If fish gelatin were used as taught by Bonderman in conjunction with the other references, no layer structure would be produced, rendering the references inoperable for their intended uses.

Regarding Examiner's assertion that the fish gelatin as taught by Bonderman is capable of forming a layer, The reference does not disclose utilizing the fish gelatin in this manner. The reference only teaches using ungelled fish gelatin. The reference fails to provide any motivation for modifying the fish gelatin to produce a layer.

The instant invention provides surprising results:

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.

**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Arenkov et al., and further in view of Cone et al.:**

The Examiner has rejected claims 16 and 28 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent No. 5,639,589 - IDS entry 1/21/2005) in view of Arenkov et al. (2000 Analytical Biochemistry 278:123-131- IDS entry 11/10/2003 transferred to PTO-892) as applied to claims 1,2,6,9-12,15 and 3-5 above, and further in view of Cone et al. (US Patent No. 2,,235,202).

The Examiner indicates the references all concern gelatin compositions and therefore are analogous art. The Examiner contends that the Office Actions dated 4/5/2006 and 1/5/2007 adequately address the remainder of Applicants' prior arguments. Applicants contest this assertion.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Arenkov relates to the use of a modified polyacrylamide gel in a protein microchip.

Cone relates to glue and the process of manufacturing glue utilizing tannins found in oak bark, hemlock bark, pine bark, chestnut wood, quebracho, and a large variety of other vegetable origins as a reagent for use in extending flues made from collagen.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable

expectation of success, and the prior art reference must teach or suggest all the claim limitations.

The references fail to teach or suggest all of the claimed limitations:

As discussed above Bauer et al. and Arenkov fail to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, or an interlayer that does not optically interfere with protein microarray applications. Cone also fails to teach or suggest these limitations. None of the references teach an adhesive interlayer that does not optically interfere with protein microarray applications, and none of the references teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes as presently claimed.

The references lack a likelihood of success:

The references also provide no likelihood of success in the use of a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The instant invention provides surprising results:

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material.

Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

The reference are non-analogous art:

The references cited by the Examiner comprise non-analogous art. In order to rely on a reference as a basis for rejection of Applicant's invention, a reference must either be in the field of the Applicant's endeavor or reasonably pertain to the particular problem with which the invention is concerned. Here, the cited references are not in Applicant's field of endeavor, that is, a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer that does not optically interfere with protein microarray applications. No reference cited addresses protein microarrays. Furthermore, Cone discloses glues made from tannins suitable for gluing wood, and fails to disclose any information relating to protein microarrays.

Regarding the Examiner's assertion that the references concern gelatin compositions, the references are not in the field of the endeavor or reasonably pertains to the particular problem with which the invention is concerned. The instant invention is a protein microarray that utilizes an interlayer to bind a substrate and gelatin layer. The gelatin layer is substantially resistant to non-specific binding and contains functional groups capable of specific binding of biological probes. The references do not relate to this field. Furthermore, the references fail to disclose the problem solved by the instant invention.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, comprise non-analogous art, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.



**Rejection Under 35 U.S.C. §103(a) over Bauer et al. in view of Dorogushin et al.:**

The Examiner has rejected claims 1, 2, 6, 9-12 and 15 under 35 U.S.C. 103(a) as being unpatentable over Bauer et al. (US Patent 5639589 - IDS entry 1/21/2005) in view of Dorogushina et al. (Soviet Union Patent SU308662 - IDS entry 1/21/2005 transferred to PTO-892).

The Examiner indicates that it would have been obvious to apply the method for generating robust gelatin subbing layers of Bauer et al. toward the film developed by Durogushin et al. This rejection is respectfully urged in error.

Bauer et al. relates to polyester photographic film base and to photographic elements having a light-sensitive photographic layer on the film base. In particular, the invention relates to a subbing layer for improving the adhesion of subsequently applied layers to polyester film base. A polyester photographic film support bears a subbing layer, which comprises a mixture of gelatin and a polymer.

Dorogushina relates to a photosensitive copying material for gravure printing which has a film, a gelatin sublayer and a photosensitive copying layer containing gelatin and chromate.

The present invention relates to a protein microarray element comprising a support and a gelatin layer containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer, wherein the adhesive interlayer does not optically interfere with protein microarray applications.

To establish a prima facie case of obviousness, there must be some suggestion or motivation in the reference or in the general knowledge available to one skilled in the art to modify the reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations.

**The references fail to teach or suggest all of the claimed limitations:**

As discussed above Bauer et al. fails to teach a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, a protein microarray, or an

interlayer that does not optically interfere with protein microarray applications. Dorogushina also fails to teach or suggest these limitations. Dorogushina fails to disclose an adhesive interlayer that does not optically interfere with protein microarray applications. In addition, Dorogushina further fails to expressly disclose a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, which would be useful as a protein microarray. Dorogushina relates to a photosensitive copying material and fails to mention any protein microarray applications.

The references lack a likelihood of success:

The references also provide no likelihood of success in the use of a support and a gelatin layer substantially resistant to non-specific binding containing functional groups capable of specific binding of biological probes, with an adhesive interlayer layer capable of maintaining contact with the support and with the gelatin layer located between the support and gelatin layer as a protein microarray. The present specification, pg. 18, line 16 – pg. 19, line 2, provides evidence that gelatin is a known, non-specific binder and the problems associated with its use in a protein microarray element. U.S. Patent No. 6,797,393, col. 9, Example 5, further illustrates the non-specific binding to protein of coated gelatin surfaces, also provides evidence that gelatin is known for non-specific binding of protein. Therefore the references provide no likelihood of success for the use of gelatin, a known non-specific binder, as a component in a layer capable of specific binding of biological probes.

The instant invention provides surprising results:

In addition, the present invention provides surprising results. As previously discussed, gelatin is a known, non-specific binder of protein to a coated surface. In addition, Table 3, col. 10 of U.S. Patent No. 6,797,393 clearly provides evidence that gelatin has a lower non-specific binding capacity than other materials, that is, gelatin is not a very good non-specific binding material. Therefore, it would be surprising to one of ordinary skill in the art to select gelatin for use as a binder of protein on a coated surface, let alone to produce a highly specific binding material.

Therefore, since the references fail to provide a motivation to combine resulting in the presently claimed invention, fail to provide any likelihood of success, fail to include all the limitations of the present claims, and, in light of surprising results, the Applicants believe the references, alone or in combination, fail to make the present invention obvious and request that the Examiner reconsider and withdraw the rejection.


**Rejection under 35 U.S.C. §112, Second Paragraph:**

The Examiner has rejected claims 2-5 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner indicates that the limitation “the support” lacks sufficient antecedent basis. Applicant has amended claims 2-5 to read “the protein microarray support” to provide proper antecedent basis for these claims. Therefore, withdrawal of this rejection is requested.

**Summary**

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited.

Respectfully submitted,

  
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